WHAT IS CLAIMED IS:

1. A process for preparing a protective barrier for a container having an internal surface comprising the steps of:

   a) plasma polymerizing under partial vacuum and in an oxygen-rich atmosphere a first organosilicon compound under conditions to deposit a polyorganosiloxane layer of uniform thickness onto the internal surface of the container; and

   b) plasma polymerizing under partial vacuum a second organosilicon compound under conditions to deposit a silicon oxide layer of uniform thickness superposing the same or a different polyorganosiloxane layer.

2. The process of Claim 1 wherein plasma polymerizing steps are carried out at such power densities and concentrations of the first and second organosilicon compounds and for such a time so that the combined thickness of the polyorganosiloxane and silicon oxide layers is less than 400 Å.

3. The process of Claim 1 wherein the first plasma polymerizing step is carried out at a deposition rate of greater than 50 Å/sec and less than 500 Å/sec and the second plasma polymerizing step is carried out at a deposition rate of greater than 10 and less than 100 Å/sec.

4. The process of Claim 1 wherein the first plasma polymerizing step is carried out at a deposition rate of greater than 100 Å/sec and less than 200 Å/sec and the second plasma polymerizing step is carried out at a deposition rate of not less 30 Å/sec and not greater 60 Å/sec.

5. The process of Claim 3 wherein the total plasma polymerizing deposition time is not more than 10 seconds.

6. The process of Claim 1 wherein the polyorgansiloxane is represented by the formula $SiO_xC_yH_z$, where x is in the range of 1.0 to 2.4, y is in the range of 0.2 to

2.4, and z is not more than 4, and the silicon oxide layer is represented by the formula SiO_x, where x is from 1.5 to 2.0.

7. The process of Claim 1 wherein the container comprises a plastic selected from the group consisting of a polyalkylene terephthalate, a polyolefin, and a polylactic acid.

8. The process of Claim 7 wherein the plastic is selected from the group consisting of a polyethylene terephthalate, a polyethylene, and a polypropylene.

9. The process of Claim 1 wherein the oxygen and the first and second organosilicon compounds are fed through an injector which is porous, open-ended, longitudinally reciprocating, rotating, coaxial, or combinations thereof.

10. The process of Claim 9 wherein the oxygen and the first and second organosilicon compounds are fed through an open-ended porous injector positioned within the container and extending almost the length of the container.

11. The process of Claim 10 wherein the porous injector is a graded porous injector, wherein porosity increases toward the base of the container.

12. The process of Claim 11 wherein porosity increases in a stepwise fashion.

13. The process of Claim 11 wherein porosity increases in a continuous fashion.

14. The process of Claim 11 wherein the inside and the outside of the container are both maintained at a partial vacuum, wherein the partial vacuum of the outside of the container is set a) so as not to allow plasma formation on the outside of the container; and b) so as to be different from the partial vacuum on the inside of the container.

15. The process of Claim 14 wherein the partial vacuum on the inside of the container is in the range of about 20 μbar to about 200 μbar, and the partial vacuum on the outside of the container is 20 mbar to about 100 mbar or less than 10 μbar.

16. In an improved apparatus for depositing a plasma-generated coating onto a surface of a container, which apparatus has:

a) an external conducting resonant cylinder having a cavity, an inside, and an outside;

b) a generator capable of providing an electromagnetic field in the microwave region connected to the outside of the resonant cavity;

c) a wave guide situated between the external conducting resonant cylinder and the generator, which wave guide is capable of directing microwaves to the inside of the external conducting resonant cylinder;

d) a cylindrical tube that is transparent to microwaves disposed within the external conducting resonant cylinder, which tube is closed on one end and open on the other end to permit the introduction of a container;

e) at least one electrically conductive plate situated in the resonant cavity; and

f) a cover for the open end;

wherein the improvement comprises an injector fitted to the cover, which injector is porous, coaxial, longitudinally reciprocating, or rotating about its longitudinal axis, or a combination thereof, which injector is insertable into a container so as to extend at least partially into the container.

17. The apparatus of Claim 16 wherein the injector is porous and open-ended.

18. The apparatus of Claim 17 wherein the injector is a graded porous injector, wherein the porosity increases toward the open-ended portion.

19. The apparatus of Claim 18 wherein the porosity increases in a stepwise fashion.

20. The apparatus of Claim 18 wherein the porosity increases in a continuous fashion.